AMENDMENTS TO THE CLAIMS

1. (Currently Amended) ~~In an~~ An input/output circuit of a process control system, comprising:

   ~~of the type having~~ a transformer that generates an analog frequency shift keying (FSK) signal for transfer across an isolation barrier, ~~the improvement wherein an~~ the FSK signal being transferred by the transformer ~~is~~ and encoded in a pulse width modulated (PWM) signal, the PWM signal comprising pulses whose widths are based on the FSK signal.

2. (Currently Amended) ~~In an~~ An input/output circuit according to claim 1, ~~the~~ further ~~improvement~~ comprising:

   a modulator that is associated with a first control device and that generates the PWM signal for application to the transformer, and

   a demodulator that is associated with a second control device and that converts the PWM signal transferred by the transformer back into another analog FSK signal.

3. (Currently Amended) ~~In an~~ An input/output circuit according to claim 2, ~~the further improvement~~ wherein each of the first and second control devices are any of a workstation, field controller, field device, smart field device, or other device for process control.

4. (Currently Amended) ~~In an~~ An input/output circuit according to claim 3, ~~the further improvement~~ wherein the second control device is the smart field device, and further comprising:

   a transmitter that is coupled to the demodulator and that transmits analog signals to/from the second control device.

5. (Currently Amended) ~~In an~~ An input/output circuit according to claim 1, ~~the further improvement~~ wherein a further FSK signal transferred by the transformer is encoded in an amplitude modulated (AM) signal.

6. (Currently Amended) ~~In an~~ An input/output circuit according to claim 5, ~~the further improvement~~ wherein the AM signal utilizes a carrier generated by a fixed duty cycle output of a modulator for generating the PWM signal.

7. (Previously Presented) Isolation logic for use in transferring information over a transformer between first and second control devices, the isolation logic comprising

a modulator that generates a pulse width modulated (PWM) signal encoding an analog frequency shift keying (FSK) signal to be transferred between the first and second control devices, the PWM signal comprising pulses whose widths are based on the FSK signal, and

the modulator being coupled to the transformer and applying the PWM signal thereto.

8. (Previously Presented) Isolation logic according to claim 7, wherein

the modulator is associated with the first control device,

the modulator applies the PWM signal to the transformer to effect transfer of the FSK signal encoded therein from the first control device to the second control device.

9. (Original) Isolation logic according to claim 8, wherein the modulator is coupled to a modem that generates the FSK signal to be transferred

10. (Previously Presented) Isolation logic according to claim 9, wherein

the modem is coupled to the first control device and receives therefrom a digital signal containing information to be transferred from the first control device to the second control device, and

the modem generates the FSK signal from the digital signal.

11. (Original) Isolation logic according to any of claims 7 - 10, wherein each of the first and second control devices include any of a workstation, field controller, field device, smart field device, or other device for any of industrial, manufacturing, service, environmental, or process control.

12. (Original) Isolation logic according to any of claims 7 - 10, wherein the FSK signal is compatible with any of a FoxComm™, HART™ or other analog control signal format.

13. (Original) Isolation logic according to any of claims 7 - 10 adapted for galvanic isolation across an isolation barrier.

14. (Previously Presented) An input/output module for use in any of industrial, manufacturing, service, environmental, or process control to transfer information over an isolation barrier between first and second control devices, the module comprising

transformer logic that inductively transfers a pulse width modulated (PWM) signal across the isolation barrier from the first to the second control device, the PWM signal being a converted, and

the transformer logic inductively transferring an amplitude modulated (AM) signal across the isolation barrier, the AM signal having encoded therein another analog FSK signal being transferred from the second to the first control device.

15. (Original) An input/output module according to claim 14, wherein the transformer logic includes a first transformer that inductively transfers the PWM signals and second transformer that inductively transfers the AM signals.

16. (Previously Presented) An input/output module according to claim 14, comprising a first modulator that is coupled to the transformer logic, the first modulator generating and applying to the transformer logic the PWM signal during a period in which the FSK signal is to be transferred from the first control device to the second control device.

17. (Original) An input/output module according to claim 16, wherein the first modulator generates and applies to the transformer logic a signal of fixed duty cycle during a period in which an FSK signal is not being transferred from the first control device to the second control device.

18. (Original) An input/output module according to claim 17, comprising a second modulator that is coupled with the transformer logic, the second modulator generating the AM signal utilizing the signal of fixed duty cycle as a carrier signal.

19. (Previously Presented) An input/output module according to claim 18, wherein

the second modulator is coupled to the second control device and receives therefrom the another FSK signal encoding information to be transferred from the second control device to the first control device, and

the second modulator generates the AM signal by modulating the carrier signal in accord with the another FSK signal received from the second control device.

20. (Previously Presented) An input/output module according to claim 19, wherein the second modulator generates the AM signal by multiplying the carrier signal by the another FSK signal received from the second control device.

21. (Previously Presented) An input/output module according to any of claims 14 - 20, wherein at least one FSK signal is compatible with any of a FoxComm^{TM}, HART^{TM} or other analog control signal format.

22. (Original) An input/output module according to any of claims 14 - 20, wherein each of the first and second control devices include any of a workstation, field controller, field device, smart field device, or other device for any of industrial, manufacturing, service, environmental, or process control.

23. (Previously Presented) A control system comprising,

a first control device and a second control device, each of the first and second control devices including any of a workstation, field controller, field device, smart field device, or other device for any of industrial, manufacturing, service, environmental, or process control,

a first analog source that generates a first analog frequency shift keying (FSK) signal encoding information for transfer from the first control device to the second control device,

a first modulator that is coupled to the first analog source, the first modulator generating a pulse width modulated (PWM) signal having encoded therein the first FSK signal, the PWM signal comprising pulses whose widths are based on the FSK signal,

a second analog source that generates a second analog FSK signal encoding information for transfer from the second control device to the first control device,

a second modulator that is coupled to the second analog source, the second modulator generating an amplitude modulated (AM) signal having encoded therein the second FSK signal, and

first and second transformers that are coupled to the first and second modulators, respectively, the first and second transformers inductively carrying the PWM and AM signals, respectively, across an isolation barrier.

24. (Original) A control system according to claim 23, comprising a first demodulator that is coupled to the transformer, the first demodulator responding to the PWM signal carried by the transformer to generate an FSK signal encoding the information being transferred from the first control device to the second control device.

25. (Original) A control system according to claim 24, comprising a second demodulator that is coupled to the transformer, the second demodulator responding to the AM signal carried by the transformer to generate an FSK signal encoding the information being transferred from the second control device to the first control device.

26. (Original) A control system according to claim 25, wherein

the first analog source, the first modulator, and the second demodulator are associated with the first control device, and

the second analog source, the second modulator and the first demodulator are associated with the second control device.

27. (Original) A control system according to claim 25, wherein

the first analog source, the first modulator, and the second demodulator are disposed on a same side of the isolation barrier as the first control device, and

the second analog source, the second modulator and the first demodulator are disposed on a same side of the isolation barrier as the second control device.

28. (Original) A control system according to claim 23, wherein the first analog source is a modem.

29. (Original) A control system according to claim 28, wherein the modem coupled to the first control device and receives therefrom a digital signal encoding the information to be transferred to the second control device.

30. (Previously Presented) A control system according to any of claims 23 - 29, wherein the FSK signals are compatible with any of a FoxComm™, HART™ or other analog control signal format.

31. (Canceled)

32. (Previously Presented) In a method of operating a process control system of the type having a transformer that transfers an analog frequency shift keying (FSK) signal across an isolation barrier, the improvement comprising encoding the FSK signal to be transferred by the transformer in a pulse width modulated (PWM) signal, the PWM signal comprising pulses whose widths are based on the FSK signal.

33. (Previously Presented) A method of transferring an analog frequency shift keying (FSK) signal over a transformer between first and second control devices, the method comprising the steps of

generating a pulse width modulated (PWM) signal to be transferred between the first and second control devices by converting the FSK signal to the PWM signal, and

applying the PWM signal to the transformer for transfer between the first and second control devices.

34. (Original) A method according to claim 33, comprising generating the PWM signal from an FSK signal generated by a modem.

35. (Original) A method according to claim 34, comprising generating information to be transferred in digital format and utilizing the modem to generate the FSK signal therefrom.

36. (Original) A method according to any of claims 33 - 35, wherein each of the first and second control devices include any of a workstation, field controller, field device, smart field device, or other device for any of industrial, manufacturing, service, environmental, or process control.

37. (Original) A method according to any of claims 33 - 35, comprising the step of generating the FSK signal in any of a FoxComm™, HART™ or other analog control signal format.

38. (Original) A method according to any of claims 33 - 35 adapted for galvanic isolation across an isolation barrier.

39. (Previously Presented) A method for use in any of industrial, manufacturing, service, environmental, or process control for transferring information over an isolation barrier between first and second control devices, the method comprising

inductively transferring a pulse width modulated (PWM) signal across the isolation barrier, the PWM signal having encoded therein an analog frequency shift keying (FSK) signal containing information being transferred from the first to the second control device, the PWM signal comprising pulses whose widths are based on the FSK signal, and

inductively transferring an amplitude modulated (AM) signal across the isolation barrier, the AM signal having encoded therein a FSK signal containing information being transferred from the second to the first control device.

40. (Original) A method according to claim 39, comprising inductively transferring the PWM signals using a first transformer and inductively transferring the AM signals using a second transformer.

41. (Original) A method according to claim 39, comprising generating and inductively transferring the PWM signal during a period in which an FSK signal is to be transferred from the first control device to the second control device.

42. (Original) A method according to claim 41, comprising generating and inductively transferring a signal of fixed duty cycle during a period in which an FSK signal is not being transferred from the first control device to the second control device.

43. (Original) A method according to claim 42, comprising generating the AM signal utilizing the signal of fixed duty cycle as a carrier signal.

44. (Original) A method according to any of claims 39 - 43, wherein the FSK signals are compatible with any of a FoxComm™ , HART™ or other analog control signal format.

45. (Original) A method according to any of claims 39 - 43, wherein each of the first and second control devices include any of a workstation, field controller, field device, smart field device, or other device for any of industrial, manufacturing, service, environmental, or process control.

46. (Previously Presented) A method of operating a control system comprising,

generating a first analog frequency shift keying (FSK) signal encoding information for transfer from a first control device to a second control device, each of the first and second control devices including any of a workstation, field controller, field device, smart field device, or other device for any of industrial, manufacturing, service, environmental, or process control,

generating a pulse width modulated (PWM) signal by converting the first FSK signal to the PWM signal,

generating a second FSK signal encoding information for transfer from the second control device to the first control device,

generating an amplitude modulated (AM) signal having encoded therein the second FSK signal, and

inductively transferring the PWM and AM signals across an isolation barrier.

47. (Original) A method of operating a control system according to claim 46, comprising responding to the PWM signal transferred by the transformer to generate a further FSK signal encoding the information being transferred from the first control device to the second control device.

48. (Original) A method of operating a control system according to claim 47, comprising responding to the AM signal transferred by the transformer to generate a further FSK signal encoding the information being transferred from the second control device to the first control device.

49. (Previously Presented) A method of operating a control system according to any of claims 46 - 48, wherein the FSK signals are compatible with any of a FoxComm™, HART™ or other analog control signal format.

50. (Previously Presented) A method of operating a control system according to any of claims 46 - 48, wherein each of the first and second control devices include any of a workstation, field controller, field device, smart field device, or other device for any of industrial, manufacturing, service, environmental, or process control.

51-54. (Canceled)

55. (Previously Presented) An input/output module according to claim 14, wherein the PWM signal comprises pulses whose widths are based on the FSK signal.

56. (Previously Presented) A method according to claim 33, wherein the PWM signal comprises pulses whose widths are based on the FSK signal.

57. (Previously Presented) A method according to claim 46, wherein the PWM signal comprises pulses whose widths are based on the FSK signal.